CLAIMS

What is claimed is:

1. A shielded probe apparatus for testing a semiconductor device, comprising:

a shielded probe for probing the semiconductor device;

a tri-axial cable coupled to a test equipment;

a shielded chassis; and

the tri-axial cable and the shielded probe being configured and arranged to connect to each other within the shielded chassis.

2. The apparatus of claim 1, wherein the shielded probe comprises:

a probe pin;

a dielectric layer, the probe pin being surrounded by the dielectric layer; and

a conductive guard layer, the dielectric layer being surrounded by the conductive guard layer.

3. The apparatus of claim 2, wherein the tri-axial cable comprises:

a center signal conductor;

a dielectric layer, the center signal conductor being surrounded by the dielectric layer;

a conductive layer, the dielectric layer being surrounded by the conductive layer;

a guard layer, the conductive layer being surrounded by the guard layer;

a second dielectric layer, the guard layer being surrounded by the second dielectric layer;

a shield, the second dielectric layer being surrounded by the shield; and

a protective cover, the shield being surrounded by the protective cover.

4. The apparatus of claim 2, wherein the shielded probe further comprises a second dielectric layer, the conductive guard layer being surrounded by the second dielectric layer.

5. The apparatus of claim 3, wherein the probe pin and the center signal conductor are electrically connected to each other.

6. The apparatus of claim 5, wherein the probe pin is electrically connected to the center signal conductor.

7. The apparatus of claim 5, further comprising a shrink tube to shrink-tube the probe pin and the center signal conductor.

8. The apparatus of claim 3, wherein the conductive guard layer of the shielded probe and the guard layer of the tri-axial cable are electrically connected to each other.

9. The apparatus of claim 8, further comprising a second shrink tube to shrink-tube the conductive guard layer and the guard layer.

10. The apparatus of claim 3, wherein the guard layer of the tri-axial cable is driven to the same potential as the center signal conductor, and the shield of the tri-axial cable is grounded to the shielded chassis.

11. A shielded probe apparatus, capable of electrically testing a semiconductor device at a sub 100fA operating current and an operating temperature up to 300C, comprising a shielded probe and a tri-axial cable that are electrically connected within a shielded chassis.

12. The apparatus of claim 11, wherein the shielded probe comprises:

a probe pin;

a dielectric layer, the probe pin being surrounded by the dielectric layer; and

a conductive guard layer, the dielectric layer being surrounded by the conductive guard layer.

13. The apparatus of claim 12, wherein the tri-axial cable comprises:

a center signal conductor;

a dielectric layer, the center signal conductor being surrounded by the dielectric layer;

a conductive layer, the dielectric layer being surrounded by the conductive layer;

a guard layer, the conductive layer being surrounded by the guard layer;

a second dielectric layer, the guard layer being surrounded by the second dielectric layer;

a shield, the second dielectric layer being surrounded by the shield; and

a protective cover, the shield being surrounded by the protective cover.

14. The apparatus of claim 12, wherein the shielded probe further comprises a second dielectric layer, the conductive guard layer being surrounded by the second dielectric layer.

15. The apparatus of claim 13, wherein the probe pin and the center signal conductor are electrically connected to each other.

16. The apparatus of claim 15, wherein the probe pin is electrically connected to the center signal conductor.

17. The apparatus of claim 15, further comprising a shrink tube to shrink-tube the probe pin and the center signal conductor.

18. The apparatus of claim 13, wherein the conductive guard layer of the shielded probe and the guard layer of the tri-axial cable are electrically connected to each other.

19. The apparatus of claim 18, further comprising a second shrink tube to shrink-tube the conductive guard layer and the guard layer.

20. The apparatus of claim 13, wherein the guard layer of the tri-axial cable is driven to the same potential as the center signal conductor, and the shield of the tri-axial cable is grounded to the shielded chassis.